

IN THE CLAIMS

Please amend the claims as indicated below.

1. (currently amended) A metal oxide material, comprising:
a metal oxide substrate; and
a coating ~~bonded to a portion of the metal oxide substrate, the coating~~ comprising an organosilane polymer and ~~the coating~~ having an improved durability, the organosilane polymer bonded to a portion of the substrate through at least 3 attachment points.
2. (original) The metal oxide of claim 1, the organosilane comprising a polycarbosilane compound.
3. (original) The metal oxide of claim 2, wherein the polycarbosilane compound is derived from a monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.
4. (original) The metal oxide of claim 3, wherein the monomer is alkyl substituted or aromatic substituted.
5. (original) The metal oxide of claim 1, wherein the coating is very stable against hydrolytic cleavage conditions.
6. (original) The metal oxide of claim 1, wherein the metal oxide is silica, titania, zirconia, or a combination thereof.
7. (original) The metal oxide of claim 1, wherein the metal oxide is silica.
8. (original) The metal oxide of claim 7, wherein the silica is used as a packing material or a support material in chromatography.
9. (currently amended) A support composition, comprising:
a metal oxide substrate; and
a coating ~~bonded to a portion of the metal oxide substrate, the coating~~ comprising an organosilane polymer and ~~the coating~~ having an improved durability, the organosilane polymer bonded to a portion of the substrate through at least 3 attachment points.

10. (currently amended) A chromatographic support composition, comprising:

a silica substrate; and

a polycarbosilane coating ~~bonded to a portion of the silica, the polycarbosilane compound~~ derived from an alkyl or aromatic substituted monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof, the polycarbosilane bonded to the silica substrate through at least three attachment points.

11. (currently amended) A support composition made by the method comprising:

providing a metal oxide substrate; and

~~providing bonding~~ a coating ~~on~~ to a portion of the substrate through at least three attachment points, the coating comprising an organosilane ~~coating polymer~~ derived from an alkyl or aromatic substituted monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.

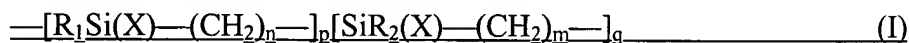
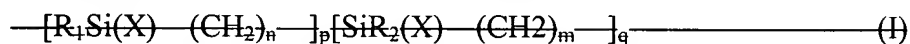
12. (withdrawn)

13. (withdrawn)

14. (currently amended) A chromatographic support composition, comprising:

a silica substrate; and

a polydentate silane of the formula (I) bonded to a portion of the silica substrate



wherein R₁ is an alkyl or aryl group having from 1 to 30 carbon atoms, R₂ is an alkyl or aryl group having from 1 to 30 carbon atoms and may be the same or different than R₁, R₁ or R₂ include a functional group similar to ~~---(CH₂)₃---N⁺Cl⁻, ---(CH₂)₂---C₆H₄---(CH₂)₃---C₆H₄---~~ SO₃H, ~~---(CH₂)₃---O---CH₂---CHOH---CH₂OH, ---(CH₂)₃---NH₂, and ---(CH₂)₃---CN,~~ n is an integer from 1 to 10, m is an integer from 1 to 10, p and q are integers from 0 to 100 (except where p+q=2 or 0), and X is a leaving group.

15. (original) The support composition of claim 14, wherein the leaving group of the polydentate silane is selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.

16. (currently amended) A method of making a metal oxide material, comprising:
providing a metal oxide substrate; and
~~providing bonding~~ a coating ~~on~~ to a portion of the metal oxide substrate through at least three attachment points, the coating comprising an organosilane polymer and having an improved durability.

17. (original) The method of claim 16, the organosilane comprising a polycarbosilane compound derived from an alkyl substituted or aromatic substituted monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.

18. (original) The method of claim 16, wherein the coating is very stable against hydrolytic cleavage conditions.

19. (original) The method of claim 16, wherein the metal oxide is silica, titania, zirconia, or a combination thereof.

20. (original) The method of claim 19, wherein the metal oxide is used as a packing material or a support material in chromatography.

21. (withdrawn)

22. (original) The method of claim 17, including providing the coating by polymerizing the monomer and then bonding the polymer to the substrate.

23. (currently amended) A method of making a chromatographic support composition, comprising:

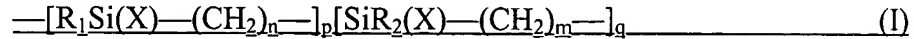
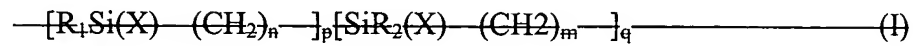
providing a silica substrate; and

~~providing bonding~~ a coating ~~on~~ to a portion of the silica substrate through at least three attachment points, ~~the coating comprising a polycarbosilane coating compound~~ derived from an alkyl or aromatic substituted monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.

24. (withdrawn)

25. (original) The method of claim 23, including providing the coating by polymerizing the monomer and then bonding the polymer to the substrate.

26. (currently amended) A method of making a coating comprising a polydentate silane of the formula (I)



wherein R_1 is an alkyl or aryl group having from 1 to 30 carbon atoms, R_2 is an alkyl or aryl group having from 1 to 30 carbon atoms and may be the same or different than R_1 , R_1 or R_2 include a functional group similar to $\text{---}(\text{CH}_2)_3\text{---N}^+\text{Cl}^-$, $\text{---}(\text{CH}_2)_2\text{---C}_6\text{H}_4\text{---}(\text{CH}_2)_3\text{---C}_6\text{H}_4\text{---SO}_3\text{H}$, $\text{---}(\text{CH}_2)_3\text{---O---CH}_2\text{---CHOH---CH}_2\text{OH}$, $\text{---}(\text{CH}_2)_3\text{---NH}_2$, and $\text{---}(\text{CH}_2)_3\text{---CN}$, n is an integer from 1 to 10, m is an integer from 1 to 10, p and q are integers from 0 to 100 (except where $p+q=2$ or 0), and X is a leaving group, the method comprising:

providing a metal oxide substrate;

providing a coating on a portion of the substrate using a monomer containing a leaving group selected from halogens, triflates, alkoxy, acyl, oximes, amines, amine salts, or combinations or mixtures thereof.

27. (withdrawn)

28. (original) The method of claim 26, including providing the coating by polymerizing the monomer and then bonding the polymer to the substrate.

29 - 35. (withdrawn)

36. (currently amended) A chromatography system containing a support material comprising:

a metal oxide substrate; and

~~a coating bonded to a portion of the metal oxide substrate, the coating comprising an organosilane-polymer and the coating having an improved durability, the organosilane polymer bonded to a portion of the substrate through at least 3 attachment points.~~

37. (currently amended) A method of using a chromatographic support material, comprising:

providing a support material including a metal oxide substrate and a coating ~~bonded to a portion of the metal oxide substrate, the coating~~ comprising an organosilane polymer and the ~~coating~~ having an improved durability, the organosilane polymer bonded to a portion of the substrate through at least 3 attachment points; and

using the support material in a chromatography column to analyze the composition of an unknown material.

38. (currently amended) A chromatographic apparatus, comprising a support material including a metal oxide substrate and a coating ~~bonded to a portion of the metal oxide substrate,~~ ~~the coating~~ comprising an organosilane polymer and ~~the coating~~ having an improved durability, the organosilane polymer bonded to a portion of the substrate through at least 3 attachment points.